

Public awareness and attitude towards *Helicobacter pylori* infection in Alahsa, Saudi Arabia

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ABSTRACT

Background: *Helicobacter pylori* (*H. Pylori*) is a gram-negative bacterium that causes stomach infections. Peptic ulcers commonly occurring in more than half the world population are caused by *H. pylori*. In addition, it acts as a triggering source in gastric malignancies, chronic gastritis, and gastroesophageal reflux disease (GERD). The current study is focused to raise the awareness of the general population in Al Ahsa city toward *H. pylori* infection. The awareness objectives are met by describing pathogen, diagnosis, risk factors, treatment, complications, and prevention. **Methods:** A cross-sectional study was developed through systematic random sampling, and a sample size of 930 people was selected for the survey questionnaire. The data were collected through an online platform, and the Richard Geiger equation was implemented to find the population. SPSS version 22 was implemented for descriptive analysis. Further categorical data were analyzed through chi-square to find the link between different variables. **Results:** The awareness level was 54.9% about *H. pylori* among the Al Ahsa population, including its risk factors, diagnosis, treatment, and complications. Participants above 40 years had a good awareness level about the disease. The results show that more awareness is needed in the population to cure the infection. **Conclusion:** The awareness level results were insignificantly higher among the male and female populations in Al Ahsa population Saudi Arabia. Other factors were also insignificantly related to the awareness level of the population.

Keywords: *Helicobacter pylori*, peptic ulcer, attitude, general population, Saudi Arabia

1. INTRODUCTION

Helicobacter pylori (*H. pylori*) is a type of gram-negative bacteria, which is considered one of the most predominant and prevalent bacterial disease affecting human populations (Khedmat et al., 2013). Furthermore, the



progression of gastric malignancies, gastroesophageal reflux disease (GERD), chronic gastritis and peptic ulceration disease, are related to *H. pylori* infection (Alsahafi et al., 2019; Tuong et al., 2020). On the other hand, most affected individuals by *H. pylori* are asymptomatic (Telmesani, 2009). Screening and treating *H. pylori* disease is of paramount importance for the effective avoidance of gastric malignancy (Alsahafi et al., 2019). Nowadays, *H. pylori* are considered the most widespread infection over the globe 50% or more of the population are infected. Recent research concerning *H. Pylori* infection among Saudi population has shown a high prevalence at 70% (Telmesani, 2009). Some studies in Saudi Arabia have also indicated that *H. Pylori* has been discovered in 67-87% of children with peptic ulcer disease (Alhussaini, 2017). *H. pylori* are responsible of a wide range of burdens in morbidity and mortality. It has pathogenic rules in peptic ulcer disease and gastric cancer, as it is correlated with approximately 63% of gastric ulcer disease, 92% of duodenal ulcer disease and 100% of gastric cancer, according to a study conducted in Riyadh, Saudi Arabia (Mohammed et al., 2020). Furthermore, it is considered the second leading cause of cancer-related mortality (Al-Zubaidi et al., 2016).

Obesity and socioeconomic status are major risk factors for acquiring *H. pylori* (Alsahafi et al., 2019 & Khan, 1998). However, there is no significant association between the pathogen and gender or age (Mohammed et al., 2020). The symptomatic presentation appears mostly after developing the ulcer, the most common recorded complaints respectively are abdominal pain, hyperacidity, underweight, vomiting and anorexia (Somily & Morshed, 2015). The diagnostic tests are either invasive or non-invasive. Non-invasive tests including urea breath test, stool antigen test, saliva and urinary antibody test and blood sample. Invasive tests, where biopsy is required, are microscopy, rapid urease test, culture, and brush cytology (Driscoll, 2017). *H. pylori* eradication can be achieved by the well-known triple therapy, which includes a proton pump inhibitor (PPI), amoxicillin, and clarithromycin, guided by the risk of having macrolide-resistant strain (Alsahafi et al., 2019). This study aims to assess public knowledge and attitude towards *H. pylori* infection in Al Ahsa, Saudi Arabia.

2. MATERIAL AND METHODOLOGY

Aims

This research is expected to raise the awareness of the general population in Alahsa city toward *H. Pylori* infection. This is by describing the pathogen, the risk factors, diagnosis, treatment, prevention, and complications.

Study Design and Participants

This was an observational, cross-sectional study carried out among 930 citizens who is living in Al Ahsa Eastern province of Saudi Arabia from June to August 2021 to assess the level awareness towards *H. pylori* infection. A systematic random sampling method applied for the selection of the participant who is from Saudi Al-Ahsa (males and females), aged 18 years old and above. Participants who were < 18 years of age, non-Saudi or Saudi from outside Al-Ahsa, and health care providers were excluded.

Data Collection Instrument and Procedures

Participants fulfilled an online questionnaire for approximately 5 minutes. The survey composed of two parts. The first part was about patient demographic in the form of age, gender, level of education. The second part was related to aware about *H. pylori* infection including its risk factors, symptoms, diagnosis, treatment and complications.

Data analysis

After data were extracted, it was revised, coded, and fed to statistical software IBM SPSS version 22(SPSS, Inc. Chicago, IL). All statistical analysis was done using two-tailed tests. P-value is considered significant if it is less than 0.05. Assessment of awareness was through calculation of corrected answered and scored one point for each. The participant is labelled as having good knowledge when score 60% or more (12 points or more). In contrast to poor knowledge when scored was less than 60% (11 points or less). Descriptive analysis were applied on all variables including participant's age, gender, education level, job title, monthly income, and awareness items including risk factors of *H. Pylori*, clinical signs, and symptoms, complications, diagnosis, and treatment methods.

3. RESULTS

A total of out of 1278 participants 930 who fulfilled the inclusion criteria completed the study questionnaire and 348 were excluded. The mean age of the participants was 29.1 ± 11.7 years old. Females were 572 (61.5%) and 601 (64.6%) participants were university

graduated while only 7.1% had below the secondary level of education. As for work, 415 (44.6%) were working with a monthly income of less than 5000 SR reported among 332 (35.7%) and 305 (32.8%) had a monthly income of 10000 SR or more (Table 1).

Table 1 sociodemographic data of study population, Al-Ahsa, Saudi Arabia

Personal data	No	%
Age in years		
< 20	29	3.1%
20-29	328	35.3%
30-39	298	32.0%
40+	275	29.6%
Gender		
Male	358	38.5%
Female	572	61.5%
Educational level		
Below secondary	66	7.1%
Secondary	263	28.3%
University	601	64.6%
Work		
Working	415	44.6%
Not working	515	55.4%
Monthly income		
< 5000 SR	332	35.7%
5000-9000 SR	293	31.5%
10000-20000 SR	251	27.0%
> 20000 SR	54	5.8%

Table 2 illustrates the distribution of awareness regarding *H. Pylori* among the general population, Al-Ahsa, Saudi Arabia. As for risk factors, the most identified among the study population were having unwashed fruits and vegetables (89.5%), followed by outdoor meals from an unknown or clean source (88.3%), Not washing hands before eating (86.5%), and having untreated and clean water (81%). Considering clinical symptoms, 89.2% of the study participants know about abdominal pain, 80% reported nausea and vomiting, 70.3% selected reflux with nausea. The feeling of heartburn as a clinical symptom was known for 69.2% of the respondents and 67.6% know about abdominal distension while 50.5% know about persistent bad breath. About diagnosis methods, the most identified was Gastrosocopy (59.5%) followed by Stool analysis (55.7%), blood test (41.9%), and Urea breath test (23.8%). Considering complications may occur with *H. pylori* infection, gastritis was reported by 64.6% of the participants, followed by gastric and peptic ulcers (58.6%), gastric cancer (24.2%). Only 12 (1.3%) told that there are no complications for *H. Pylori* infection. Almost all the participants 886 (95.3%) agreed that think *H. Pylori* infection should be treated. Exact 590 (63.4%) correctly reported antibiotics as the treatment used for *H. Pylori* infection while only 39 (4.2%) told that there is no treatment.

Figure 1 shows overall awareness level regarding *H. Pylori* among the general population, Al-Ahsa, Saudi Arabia. More than half (54.9%) showed good awareness and attitude towards *H. Pylori* infection considering risk factors, symptoms, diagnosis, complications, and treatment. Poor awareness was detected among 419 (45.1%) participants. Table 3 demonstrates the distribution of public awareness regarding *H. Pylori* by their personal data. The exact 63.3% of old-aged participants (> 40 years) had a good awareness level regarding *H. Pylori* infection compared to 37.9% of the young aged group (< 20 years) with recorded statistical significance ($P=0.001$). Awareness level was insignificantly higher among the male population than females (56.1% vs. 54.2%, respectively), Other factors were insignificantly associated with participant's awareness level.

Table 2 Distribution of awareness regarding *H. Pylori* among general population, Al-Ahsa, Saudi Arabia

Domain	Items		No	%
Risk factors	Having untreated and clean water	Yes	753	81.0%
		No	68	7.3%
		Don't know	109	11.7%
	Having unwashed fruits and vegetables	Yes	832	89.5%
		No	54	5.8%
		Don't know	44	4.7%
	Outdoor meals from an unknown or clean source	Yes	821	88.3%
		No	42	4.5%
		Don't know	67	7.2%
	Not washing hands before eating	Yes	804	86.5%
		No	62	6.7%
		Don't know	64	6.9%
Clinical symptoms	Abdominal pain	Yes	830	89.2%
		No	38	4.1%
		Don't know	62	6.7%
	Feeling of heartburn	Yes	644	69.2%
		No	113	12.2%
		Don't know	173	18.6%
	Reflux with nausea	Yes	654	70.3%
		No	113	12.2%
		Don't know	163	17.5%
	Abdominal distension	Yes	629	67.6%
		No	120	12.9%
		Don't know	181	19.5%
	Nausea and vomiting	Yes	744	80.0%
		No	70	7.5%
		Don't know	116	12.5%
Diagnosis	Persistent bad breath	Yes	470	50.5%
		No	179	19.2%
		Don't know	281	30.2%
	Methods used to diagnose <i>H. pylori</i> infection?	Gastroscopy	553	59.5%
		Blood test	390	41.9%
		Stool analysis	518	55.7%
		Urea breath test	221	23.8%
		Don't know	132	14.2%
Complications	Complications may occur with <i>H. pylori</i> infection?	Gastric and peptic ulcers	545	58.6%
		Gastritis	601	64.6%
		Gastric cancer	225	24.2%
		No complications	12	1.3%
		Don't know	212	22.8%
Treatment	<i>H. Pylori</i> should be treated	Yes	886	95.3%
		No	11	1.2%
		Don't know	33	3.5%
	What is the treatment for <i>H. Pylori</i> ?	Antibiotics	590	63.4%
		No treatment	39	4.2%
		Don't know	301	32.4%

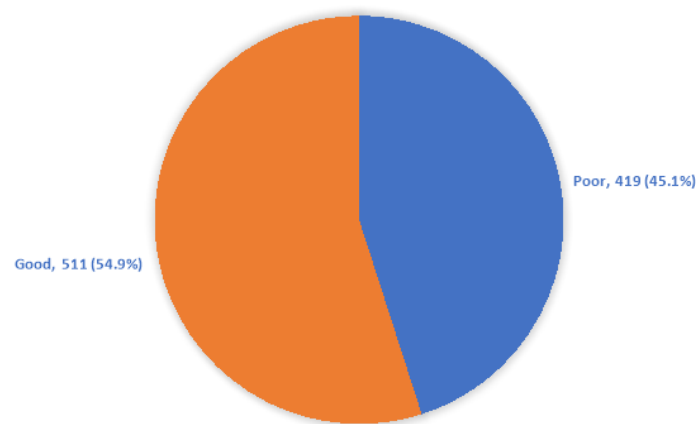


Figure 1 Overall awareness level regarding *H. Pylori* among general population, Al-Ahsa, Saudi Arabia

Table 3 Distribution of public awareness regarding *H. Pylori* by their personal data

Personal data	Overall awareness level				p-value
	Poor		Good		
	No	%	No	%	
Age in years					
< 20	18	62.1%	11	37.9%	.001*
20-29	174	53.0%	154	47.0%	
30-39	126	42.3%	172	57.7%	
40+	101	36.7%	174	63.3%	
Gender					
Male	157	43.9%	201	56.1%	.561
Female	262	45.8%	310	54.2%	
Educational level					
Below secondary	29	43.9%	37	56.1%	.951
Secondary	117	44.5%	146	55.5%	
University	273	45.4%	328	54.6%	
Work					
Working	187	45.1%	228	54.9%	.997\$
Not working	232	45.0%	283	55.0%	
Monthly income					
< 5000 SR	154	46.4%	178	53.6%	.867
5000-9000 SR	129	44.0%	164	56.0%	
10000-20000 SR	110	43.8%	141	56.2%	
> 20000 SR	26	48.1%	28	51.9%	
<i>P</i> : Pearson X ² test		<i>\$</i> : Exact probability test		* <i>P</i> < 0.05 (significant)	

4. DISCUSSION

The current study was established to assess public awareness and attitude towards the *Helicobacter pylori* (*H. Pylori*) infection in Al-Ahsa, Saudi Arabia also, to detect determinants of public awareness level regarding the disease. Chronic *H. pylori* infection is leading to 78% of gastric cancer cases (Torre et al., 2015). Globally, gastric cancer is considered as third leading cause of cancer-related death and ranks 5th of top cancers (Chey et al., 2017). Individuals with history of peptic ulcer and MALT lymphoma are classified as at-risk populations (Goodman et al., 2008). Those groups require early screening to prevent further complications (World Health Organization, 2008; Chen, 2005). The current study revealed that Al-Ahsa population had good knowledge towards *H. Pylori* infection. The highest area of knowledge was risk factors in which more than 75% of them correctly defined all relevant *H.*

Pylori infection risk factors especially unhealthy dietary habits and outdoor meals. Clinical symptoms awareness was more than average as abdominal pain (89.2%) with nausea and vomiting (80%). Other clinical symptoms were reported but with less frequency such as a feeling of heartburn, reflux, and abdominal distension as more than two-thirds of the participants correctly reported for these symptoms. Persistent bad breath was known for only half of the participants. On average, about half of the participants know the diagnostic methods for *H. Pylori* infection especially gastroscopy, stool analysis, and blood test. The urea breath test was reported by nearly one-quarter of the participants (23.8%).

Gastritis and gastric or peptic ulcers were the most identified complication by the study population (about two-thirds correctly reported for these complications) where only one quarter (24.2%) knows about gastric ulcers. The vast majority of the participants agreed that *H. Pylori* infection should be treated and two-thirds of the participants told about antibiotics as the treatment available. This estimated awareness level was higher than what was reported among many literature findings. Driscoll et al., (2017) conducted a literature review including 9 studies assessing level of awareness and attitude towards *H.pylori* among general population. The review showed that six studies assessed *H. pylori* awareness and perception (Xia et al., 2012; Oh et al., 2009; Shin et al., 2013; Wynne et al., 2013; Wu et al., 2020). General awareness about *H. pylori* was poor across all these studies.

In two studies, showed that only 22 to 35% of respondents were had heard about *H. pylori* (Xia et al., 2012; Oh et al., 2009). Remarkably, one study reported that patients with negative test for *H. pylori* had heard of the infection more than those who had a positive test (Oh et al., 2009). Also, (Wu et al., 2020) estimated a lower knowledge among the Chinese population regarding *H. Pylori* as only 16% answered correctly to all questions about *H. pylori's* infectivity. Locally, Dafalla et al., (2021) found that 61.6% of the Saudi population in Jeddah had poor awareness regarding peptic ulcers and *H. Pylori* infection. Also, Hafiz et al., (2021) found that less than 10% of the university students had a good knowledge level about *H. pylori*. The only factor associated with high awareness level was participant's age where old aged respondents showed higher awareness level. This may be explained by that those old aged group experienced GERD, gastritis, or gastric ulcers many times and they heard about *H. Pylori* either generally or from the physician side.

5. CONCLUSION

In conclusion, the study results showed that public awareness at Al-Ahsa regarding *H. Pylori* infection was higher than the trend especially for risk factors with signs and symptoms. Only old age was the significant determinant of high awareness level. A high portion of the public was unaware of some diagnostic tools and complications mainly cancer. Periodic health education programs are recommended to improve public awareness regarding *H. Pylori* as a preventable disorder with long-life morbidity.

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Author contribution

All authors of this study were equally involved in the design of the study, data collection, analysis, drafting and correction of the final draft, and the author was responsible for the proper implementation of the study at all stages. There is no author whose name is not listed in the authors list.

Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

Ethical approval

The study was approved by the Medical Ethics Committee of Research Center, Almoosa Specialist Hospital (ethical approval code: ARC-21.09.02)

Abbreviation and Acronyms

H. pylori: *Helicobacter pylori*

GERD: Gastroesophageal reflux disease

Conflicts of interest

The authors declare that they have no conflict of interest.

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This study has not received any external funding.

Data and materials availability

All data associated with this study are present in the paper.

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